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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/509,117	09/28/2004	Masaaki Takegami	4633-0126PUS1	1035
2292 7590 09/08/2008 BIRCH STEWART KOLASCH & BIRCH PO BOX 747 FALLS CHURCH, VA 22040-0747				
EXAMINER				
NALVEN, EMILY IRIS				
ART UNIT		PAPER NUMBER		
3744				
NOTIFICATION DATE		DELIVERY MODE		
09/08/2008		ELECTRONIC		

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

mailroom@bskb.com

Office Action Summary

Application No.

10/509,117

Applicant(s)

TAKEGAMI ET AL.

Examiner

Emily Iris Nalven

Art Unit

3744

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 31 July 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-5 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-5 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-946)
- 3) ☐ Information Disclosure Statement(s) (PTO/SF/ICE)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Response to Amendment

Receipt of amendment filed on July 31, 2008 is acknowledged.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. **Claims 1-4** are rejected under 35 U.S.C. 102(a) as being unpatentable over Tanimoto et al. (US Patent No. 6,698,217 B2) in view of Shaw (US Patent No. 4,497,185).

In regard to claim 1, Tanimoto et al. teach a refrigerating apparatus (1) in which a refrigerant circuit which performs a vapor compression refrigerating cycle (col 8 lines 25-29) is provided with an oil return passageway (31) through which refrigerating machine oil separated on the discharge side of the compressors (2A) is injected into the suction side of said compressors (2B, 2C) (see Fig. 1 and col 10 lines 64-657 and col 11 line 1) comprising a liquid injection passageway (10, 27) (see Fig. 1 and col 10 lines 54-55) through which liquid refrigerant is injected into the suction side of said compressors (2A, 2B) (see Fig. 1 and col 9 lines 26-28), wherein said oil return passageway (31) is connected to said liquid injection passageway (27) (see Fig. 1) in which gas refrigerant in said oil return

passageway (31) is mixed with said liquid refrigerant prior to injecting into the suction side of said compressors (2A).

However, Tanimoto et al. do not explicitly teach the oil return passageway is connected directly to the liquid injection passageway. Shaw teach a compressor (12) with an oil return passageway (line 68, 68a) that is directly connected to a refrigerant injection passageway (from nozzle 70) in which the oil is mixed with refrigerant (in passage 48 and port 22) before entering the compressor (see Fig. 1). It would have been obvious to one of ordinary skill in the art at the time of the invention to mix the refrigerant and oil before entering the compressor to ensure that the compressor stays well lubricated during the entire period the refrigerant is being compressed and to improve the efficiency of the compressor.

In regard to claim 2, Tanimoto et al. teach a refrigerating apparatus (1) in which a refrigerant circuit which performs a vapor compression refrigerating cycle (col 8 lines 25-29) is provided with a gas injection passageway (15) through which gas refrigerant is injected into the suction side of the compressors (2A, 2B) (see Fig. 1 and col 9 lines 26-30) comprising a liquid injection passageway (10, 27) (see Fig. 1 and col 10 lines 54-55) through which liquid refrigerant is injected into the suction side of said compressors (2A, 2B), wherein said gas injection passageway (15) is connected to said liquid injection passageway (10, 27) (see Fig. 1) in which gas refrigerant in said oil return passageway (31) is mixed with

said liquid refrigerant prior to injecting into the suction side of said compressors (2A).

However, Tanimoto et al. do not explicitly teach the gas injection passageway is connected directly to the liquid injection passageway. Shaw teach a compressor (12) with an liquid return passageway (line 68, 68a) that is directly connected to a gas/liquid injection passageway (from nozzle 70) in which the oil is mixed with refrigerant (in passage 48 and port 22) before entering the compressor (see Fig. 1). It would have been obvious to one of ordinary skill in the art at the time of the invention to mix the refrigerant and liquid oil before entering the compressor to ensure that the compressor stays well lubricated during the entire period the refrigerant is being compressed and to improve the efficiency of the compressor.

In regard to claim 3, Tanimoto et al. teach the refrigerating apparatus (1) comprising a heat source side unit (4) and utilization side (41, 45, 51) units being connected with one another (see Fig. 1) wherein the degree of superheat of suction refrigerant of said compressors (2A, 2B, 2C) is controlled by adjusting the rate of flow of refrigerant flowing through said liquid injection passageway (10, 27) without operating expansion mechanisms provided in said utilization units (4) (see Fig. 1 and col 10 lines 43-53).

In regard to claim 4, Tanimoto et al. teach the refrigerating apparatus (1) wherein said compressors (2B, 2C) are variable displacement compressors (col 8 lines 48-52) wherein said liquid injection passageway (10, 27) is opened

whenever the operating capacity of said compressors (2B, 2C) exceeds a predetermined value (col 13 lines 48-52).

3. **Claim 5** is rejected under 35 U.S.C. 103(a) as being unpatentable over Tanimoto, et al. (US Patent No. 6,698,217 B2) in view of Shaw (US Patent No. 4,497,185) in view of Tanimoto, et al. (US Patent Pub No. 2004/0112082).

In regard to claim 5, Tanimoto, et al. ('217), as modified by Shaw teach wherein at least one of said compressors (2B, 2C) is deactivated until the operating capacity of said compressors (2B, 2C) but don't explicitly teach until it exceeds a predetermined value (col 1 lines 33-36 and col 1 line 67 and col 2 lines 1-23). Tanimoto, et al. ('082) explicitly teach deactivating a compressor if the capacity becomes to low (para 17 and para 18). It would have been obvious to one of ordinary skill in the art at the time of the invention to deactivate the compressor until it exceeds a predetermined value as taught by Tanimoto, et al. ('082) in the system as taught by Tanimoto, et al. ('217), as modified by Shaw, because the efficiency of the system is improved and prevents any wear on the system should a compressor be operating at too low a capacity.

Response to Arguments

Applicant's arguments filed July 31, 2008 have been fully considered but they are not persuasive. The Applicant argues that Shaw does not teach port (22) is for supplying liquid refrigerant to the compressor separately from gas refrigerant. However, a port for liquid and gas refrigerant to be completely separate is not claimed by the Applicant. Additionally, the Applicant argues that Shaw does not teach an oil or gas

return passageway that is connected directly to a liquid injection passageway. However, it is clear from Fig. 1 that oil return passageways (68a, 68b) coming from the oil return line (68) and oil separator (14) mixes directly with the liquid injection passage (line coming from 34) in the large port indicated by 48 at the top of the compressor and 22 at the left side where the oil and liquid refrigerant mix as they enter the compressor to be compressed by the compressor rotors (see Fig. 1). Additionally, claim 1 does not claim that a function of the apparatus is to reduce abnormal noises as stated by the Applicant in the response to the previous Office Action.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Emily Iris Nalven whose telephone number is 571-272-3045. The examiner can normally be reached on Monday - Thursday 8 AM - 5:30 PM and on alternate Fridays 8 AM – 4:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisors, Cheryl J. Tyler can be reached on 571-272-4834 or Frantz Jules can be reached on 571-272-6681. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Emily Iris Nalven
Art Unit 3744
August 31, 2008
/Emily Iris Nalven/

/Cheryl J. Tyler/
Supervisory Patent Examiner, Art
Unit 3744